Practice: 620 - Underground Outlet

Scenario: #1 - Pipe, no inlet, 6 inch or less

Scenario Description:

Install 280 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 6" HDPE pipe, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

"Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Mangement (558) and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Foot

Scenario Typical Size: 300

Scenario Cost: $1,508.09 **Scenario Cost/Unit:** $5.03

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	82	$208.28
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.87	82	$153.34
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	2	$76.16
Materials						
Pipe, HDPE, 6", CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	$1.12	280	$313.60
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.57	20	$131.40
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #2 - Pipe, no inlet, 12 inch or less

Scenario Description:

Install 280 feet of 12" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 12" HDPE pipe, trench excavation, trench backfill, 20' of 12" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

"Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Mangement (558) and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Foot

Scenario Typical Size: 300

Scenario Cost: $2,847.49 **Scenario Cost/Unit:** $9.49

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.87	82	$153.34
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	82	$208.28
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	2	$76.16
Materials						
Pipe, HDPE, 12", PCPT, Single Wall	1274	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 12" diameter - ASTM F667. Material cost only.	Foot	$4.78	280	$1,338.40
Pipe, PVC, 12", SDR 35	1252	Pipe, PVC, SDR 35, 12" Diameter - ASTM D3034. Material cost only.	Foot	$22.30	20	$446.00
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #3 - Pipe, no inlet, greater than 12 inch

Scenario Description:

Install 300 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 44" deep and 24" wide. Costs include 18" HDPE pipe, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet (outlet pipe not seperate since component is double wall pipe). This practice is often installed in conjunction with roof runoff management or similar practices.

Before Situation:

Roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

"Clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Diversion (342), Roof Runoff Mangement (558) and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Foot

Scenario Typical Size: 300

Scenario Cost: $4,357.09 **Scenario Cost/Unit:** $14.52

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.87	82	$153.34
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	82	$208.28
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	2	$76.16
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	1245	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$10.98	300	$3,294.00
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #4 - Pipe, riser, 6 inch or less

Scenario Description:

Install 480 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated approximately 54" deep and 15" wide by hydraulic excavator. Costs include 6" HDPE corrugated single wall plastic tubing, 8" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 6" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: $2,579.23 **Scenario Cost/Unit:** $5.16

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.21	10	$582.10
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	105	$266.70
Labor						
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12", Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$25.16	10	$251.60
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	2	$76.16
Materials						
Inlet, riser, 8"	1262	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 8" diameter. Materials only.	Each	$108.36	1	$108.36
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.57	20	$131.40
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Pipe, HDPE, 6", CPT, Single Wall	1242	Pipe, Corrugated Plastic Tubing, Single Wall, 6" diameter - ASTM F405. Material cost only.	Foot	$1.12	480	$537.60
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #5 - Pipe, riser, 12 inch or less

Scenario Description:

Install 480 feet of 10" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 10" HDPE pipe, 12" Perforated PVC Riser Inlet, trench excavation, trench backfill, 20' of 10" PVC outlet pipe with rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: $4,722.50 **Scenario Cost/Unit:** $9.45

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	210	$533.40
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Hydraulic Excavator, .5 CY	930	Track mounted hydraulic excavator with bucket capacity range of 0.3 to 0.8 CY. Equipment and power unit costs. Labor not included.	Hour	$58.21	10	$582.10
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	4	$152.32
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$25.16	10	$251.60
Materials						
Pipe, PVC, 10", SDR 35	1251	Pipe, PVC, SDR 35, 10" Diameter - ASTM D3034. Material cost only.	Foot	$10.44	20	$208.80
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Pipe, HDPE, 10", PCPT, Single Wall	1273	Pipe, Corrugated Plastic Tubing, Single Wall, Perforated, 10" diameter - ASTM F667. Material cost only.	Foot	$3.82	480	$1,833.60
Inlet, riser, 12"	1264	Riser, polymer, complete vertical perforated UGO inlet with Tee, orifice plate if needed, 12" diameter. Materials only.	Each	$535.37	1	$535.37
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #6 - Pipe, riser, greater than 12 inch

Scenario Description:

Install 500 feet of 18" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 64" deep and 32" wide. Costs include 18" HDPE pipe, an additional 6' of 18" HDPE to serve as a Riser Inlet, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit, including outlet pipe

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: $8,438.63 **Scenario Cost/Unit:** $16.88

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	263	$668.02
Hydraulic Excavator, 1 CY	931	Track mounted hydraulic excavator with bucket capacity range of 0.8 to 1.5 CY. Equipment and power unit costs. Labor not included.	Hour	$118.55	10	$1,185.50
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	4	$152.32
Equipment Operators, Heavy	233	Includes: Cranes, Hydraulic Excavators >=50 HP, Dozers, Paving Machines, Rock Trenchers, Trenchers >=12”, Dump Trucks, Ag Equipment >=150 HP, Scrapers, Water Wagons.	Hour	$25.16	10	$251.60
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Pipe, HDPE, CPT, Double Wall, Soil Tight, 18"	1245	Pipe, Corrugated HDPE Double Wall, 18" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$10.98	506	$5,555.88
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #7 - Pipe, drop inlet, 6 inch or less

Scenario Description:

Install 500 feet of 6" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench is excavated 54" deep and 24" wide by hydraulic track excavator. Costs include 6" Sch 40 PVC pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: $5,340.61 **Scenario Cost/Unit:** $10.68

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	170	$431.80
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.87	170	$317.90
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	2	$76.16
Materials						
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$604.44	1	$604.44
Pipe, PVC, 6", SCH 40	980	Materials: - 6" - PVC - SCH 40 - ASTM D1785	Foot	$6.57	500	$3,285.00
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54

Practice: 620 - Underground Outlet

Scenario: #8 - Pipe, drop inlet, 12 inch or less

Scenario Description:

Install 500 feet of 12" approved plastic pipe to convey stormwater from one location to a suitable and stable outlet. Trench Excavation is 58" deep and 28" wide. Costs include 12" HDPE pipe, Precast concrete drop inlet with steel grate, trench excavation, trench backfill, rodent guard and laid up stone headwall at outlet. This practice is often installed in conjunction with terraces, diversions, sediment control basins, waterways or similar practices.

Before Situation:

Excessive sedimentation and soil erosion as a result of gully, rill or sheet erosion which exceeds "T" from farm fields and other locations. Also, roof runoff or surface runoff that becomes contaminated with agricultural wastes that significantly contributes to the amount of runoff that has to be stored or treated.

After Situation:

Field system meets "T" or "clean" storm water runoff is diverted away from an agricultural waste management system to minimize the volume of runoff that is contaminated by agricultural waste. Associated practices are Critical Area Planting (342), Grassed Waterway (412), Terrace (600), Diversion (342), Water and Sediment Control Basin (638), and Subsurface Drainage (606)

Scenario Feature Measure: Length of Conduit

Scenario Unit: Feet

Scenario Typical Size: 500

Scenario Cost: $5,868.17 **Scenario Cost/Unit:** $11.74

Cost Details (by category):

Component Name	ID	Component Description	Unit	Price ($/unit)	Quantity	Cost
Equipment/Installation						
Compaction, earthfill, vibratory plate	1260	Compaction of earthfill with a walk behind vibratory plate compactor in typical 6-8 inch thick lifts, 2 passes. Includes equipment and labor.	Cubic Yard	$2.12	2	$4.24
Excavation, common earth, small equipment, 50 ft	1220	Bulk excavation of common earth with dozer <100 HP with average push distance of 50 feet. Includes equipment and labor.	Cubic Yard	$2.54	210	$533.40
Excavation, common earth, side cast, large equipment	1227	Bulk excavation and side casting of common earth with hydraulic excavator with less greater than 1 CY capacity. Includes equipment and labor.	Cubic Yard	$1.87	210	$392.70
Labor						
Supervisor or Manager	234	Labor involving supervision or management activities. Includes crew supervisors, foremen and farm/ranch managers time required for adopting new technology, etc.	Hour	$38.08	4	$152.32
Materials						
Pipe, HDPE, CPT, Double Wall, Soil Tight, 12"	1244	Pipe, Corrugated HDPE Double Wall, 12" diameter with soil tight joints - AASHTO M294. Material cost only.	Foot	$7.12	500	$3,560.00
Catch Basin, concrete, 2'x2'x6'	1257	Catch Basin, Precast Concrete, 2' square or round, cast grate, 6' deep. Includes materials, equipment and labor.	Each	$604.44	1	$604.44
Rock Riprap, Placed with geotextile	44	Rock Riprap, placed with geotextile, includes materials, equipment and labor to transport and place	Cubic yard	$89.53	1	$89.53
Mobilization						
Mobilization, medium equipment	1139	Equipment with 70-150 HP or typical weights between 14,000 and 30,000 pounds.	Each	$265.77	2	$531.54